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sibility of creating life and the *possibility* of eliminating death mean no more than that we may define life without reference to its beginning or end. Whether we can find or produce beings that fall within this definition and *also* meet certain conditions of beginning and ending is a purely empirical question, the ground of whose answering lies quite outside of the definition.

Birth and death then are only synthetically attached to life, but while the motive for reading birth into the definition of life is no deeper than an habitual association of ideas, I am not sure that the insistence on death as a thing whose germ lies in birth is to be explained in the same way. For we have seen that the teleological method of defining which gives us our concept of life is essentially statistical and looks upon the future of each thing in a class as a matter of probability. In order that there should be nothing more than probability, there must be a possibility that the future expected should not arrive: there must then be cases in which it does not. But the defeat of the purpose of the living being is death, and so its occurrence would seem to be essential to the meaning of life. It will be remarked, however, that this necessity of death is but a requirement that some die, not that all die. Death is an essential phenomenon of a group taken collectively, not of that group taken distributively. As for any individual, it is enough that for him life is not certain, nothing requires us to maintain that death is.

So I have defined life without reference to its beginning or its end; I have also defined it without reference to its higher and lower forms. It is possible to do this because so far as life goes the existence of the higher form is not involved in the meaning of the lower, and conversely. Where, however, these differences of higher and lower life exist it is possible to introduce a new category to describe their relations. This new category is *mind*.

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A DEFINITION OF CAUSATION: A REPLY TO PROFESSOR SHELDON

PROFESSOR SHELDON, in an interesting series of four articles recently contributed to this JOURNAL,¹ draws attention to a new definition of causation. His results may be summarized as three-fold:² (1) that two types of causation clearly emerge, "a certain serial type called a self-repeater, and one of composition"; (2) that "the

¹ Volume XI., pages 197, 253, 309, 365.

² Vol. XI., page 365.

cause is *two terms*" and not "*one term alone*, where Hume and his successors always looked for it"; and, (3) "that there is a *necessity* in the existent world." I shall direct attention to (2) and (3) only. The reason for the restriction lies in the mere desire to narrow the issue. I wish also to state in advance that I do not take issue with the *conclusions* advanced in (2) and (3), but with the argument offered in their support.

That "the cause is *two terms*" and not "*one term alone*," is a correction of "Hume and his successors" that easily welcomes an emphatic approval. On this point, as in so many others, Hume's displacement of Locke in general esteem has proved a detriment to subsequent tradition. Thus Locke, unlike Hume, and in part coincident with the results reached by Professor Sheldon, emphasized (1) the duality of our cause; (2) a necessity existent in "the constant and regular order" of things, together with a necessity that the causal situation more directly inspires; and (3) an element which Professor Sheldon omits adequately to note and incorporate; namely, the presence of *change*. I must touch somewhat upon each of these points in Locke before I turn to Professor Sheldon's results.

Locke writes: "There must always in relation be two ideas or things, either in themselves really separate, or considered as distinct, and then a ground or occasion for comparison."³ He thinks this duality of terms to be true of "relations" in general. The causal relation with him differentiates itself from other relations in the fact that "the ground or occasion for comparison" in causation is change. Thus we read: "wherever change is observed the mind must collect a power somewhere able to make that change, as well as a possibility in the thing itself to receive it."⁴ It is with an emergence of change, then, in one or more of the initial terms that Locke would seem to find the first moment in an analysis of causation. It follows by natural consequence that, in the emergence of change, we also have the essential differentia of a causal from a non-causal situation.

The term "power," however, in the above citation, carries an objectionable meaning and tradition. We, with Hume, have come to reject it. But, in justice to Locke, let us remember that he, too, rejected it quite as forcibly as did Hume. The contention Locke reiterates without end assumes a form not unlike that reached by Hume. He writes: "We have by daily experience clear evidence of motion produced by impulse and thought. But the manner how, hardly comes within our comprehension; we are equally at a loss in both. . . . For when the mind would look beyond those original ideas we have from sensation or reflection, and penetrate into their causes, and

³ "Essay on the Human Understanding," Bk. II., Ch. 25, Sec. 6.

⁴ *Ibid.*, Ch. 21, Sec. 4.

manner of production, we find it discovers nothing but its own short-sightedness; . . . there is no more difficulty to conceive how a substance we know not, should by thought, set body in motion, than how a substance we know not, by impulse, set body in motion."⁵ He thereupon concludes, that "powers are relations and not agents."⁶ That is, "the changes which one body is apt to receive from or produce in other bodies upon due application" are of such a nature as to leave us in total darkness as to the manner of their production. What we have, therefore, in Locke is *a relation of objects, not of agents*. But not any object at random is capable of receiving or producing a change in another object; objects of a "due application" only have this capacity, or, as I prefer to express it, objects that are mutually *effective* and not such as are mutually *neutral* in respect to each other. This distinction is vital and I shall enlarge upon it later. For the present, the point I wish to enforce is that with Locke, as emphatically as with Hume, we are enjoined in the formulation of the causal situation not to transcend such data as are directly offered us in our sense perception, except possibly in the form of a working hypothesis.

Thus conceived, an investigation of the causal situation would resolve itself into the following parts: (1) an investigation into the nature and foundation of change in support of the distinction it establishes between a causal and a non-causal situation; and (2), an investigation into the elements (our related objects), in reference to which change is found to emerge and in reference to which change must be grounded and explained to the extent of its susceptibility to explanation.

A consideration of (1) and (2), however, will not fail to give proof of the presence of a thought-process. Hence, to ignore or deny the presence of a thought-process is apt to invite ambiguity and even failure. The following statements extracted from the articles in question intimate such ambiguity. "The main results of this investigation are, that there is a necessity in the existent world, and that it is not an absolute *a priori* necessity, but one *derived from the existence of a dyadic relation*."⁷ That is, given "two terms in a certain relation . . . *the rest of necessity and by pure deduction follows*."⁸ Or again: necessity is found "in the empirical contents of experience, rather than in the form imposed on it by mind."⁹ I hold such statements in question if they intimate, as I fear, a failure to distinguish between an immediate perception that is ultimate with-

⁵ *Ibid.*, Ch. 23, Secs. 28-29.

⁶ *Ibid.*, Ch. 21, Sec. 19.

⁷ This JOURNAL, Vol. XI., page 376.

⁸ *Loc. cit.*, page 375. The italics are not mine.

⁹ Page 375.

out mediation of any kind, and one that is immediate after a prior mediacy. That causation, in respect to the varied elements it combines—change among others—embodies such mediacy, requires no extended proof. I think we are safe in assuming, in the way of a proof, (*a*) that, without the emergence of change (a fact Professor Sheldon inclines to ignore) in one or more of the terms of the initial or dual situation, we have a non-causal and not a causal situation; and (*b*) that, without comparison and without data for a comparison, change for us can not even so much as emerge (appear). Such comparison demands that our original terms have each their more or less specific measure and boundary (a thing demanding thought), and, secondly, that the new element that appears in the form of change be a distinguishable element. If the “change” is not an element that is distinguishable, the presence of change is either not recognized, or, if recognized from one standpoint, is denied from another. Hence chemistry is disposed to deny *real* change in a mere mechanical mixture or composition. It is even disposed to deny a *real* change in a chemical mixture or composition, when compounds are held to as mere functions of its eighty or more elementary substances. But it does hold that a chemical change is more truly a change than a mechanical one. In all this, however, a thought-process operating under the control of certain principles is clearly evident. It is still further evident where our new element, the so-called change-datum, acquires the status of an adjective only or that of a substantive. Thus a general chemist regards water, vapor, and ice as mere adjectives of the so-called mass, H_2O ; whereas the physical chemist regards them as substantive in character. Such differences, which are to be multiplied at will, are not without their foundation and special points of reference. The fact I seek to establish is that whether I assign the adjective or substantive status to the new change-datum as manifested in the original situation depends entirely upon the measure and boundary affixed to the dual or multiple objects prior to their entrance into a causal situation. If the change-datum is compatible with the measure and boundary of our original terms, then one or more of the original terms would appropriate it, and the element of change would appear as an adjective and not as a substantive. If, however, such change-datum is incompatible with the defined measure and boundary of the original terms, then it is that the change-datum emerges as a new *thing*. But decision of this character clearly indicate the presence of a thought-process and a multiple of principles at every point.

So much taken for granted: let us now turn to Professor Sheldon's definition of causation. Each of the two types established by him “starts from a duality. . . . This is self-evident in the case of composition, where two factors plus the relation of combination deter-

mine unambiguously the resultant. In the case of the series, . . . two terms with a relation of sameness—and also of difference—between them determine unambiguously the remainder.”¹⁰ That is, “two terms plus the relation” determine the result. But if two terms *plus* the relation is one thing and two terms *minus* the relation another, by what mark or sign are we to tell when the required “relation” is present or absent? The phrase “plus the relation” presents itself as an addition to the two terms. But what is it? For unless it is at once real and distinctive, how am I to tell by an exclusive attention to a relation that it is present or absent; and, if present, that it is the relation of “combination” or “sameness” or some non-causal relation? Or is it not at all a matter of “relations,” but a matter of “terms”? If so, will *any* two terms do? If not, “two terms” of what kind are required? Unless we can answer these questions, “plus the relation” remains a mere phrase. Locke has said as much and as little in his phrase that “powers are relations and not agents.” For the question would persist: if the causal relation is real and distinctive, what is its nature and foundation? You can not find the required foundation or differentia in “sameness with a difference,” for this principle of “sameness with a difference” is not and can not be restricted to the causal situation, inasmuch as it is vital to a thought-process in general.

Suppose, then, we follow Locke and identify our “relation” with a change-datum. In this case to say that the “relation” is present when our dual terms “combine” and absent when they do not thus combine (either mechanically or chemically) would suggest the solution, but the solution would be one that made *change* and not the *dual* terms the more ultimate element in the causal situation. Moreover, if he accepts this suggestion, the meaning of “relation” would convert itself into a matter of “terms”; for “change,” in its status, is either an adjective or a substantive. A causal “relation,” then, is as real and as distinctive as a *change* in the *terms*.¹¹ If so, what we ought to say is, that two or more terms

¹⁰ *Loc. cit.*, page 371.

¹¹ It is in virtue of this fact that a causation of one order of existence distinguishes itself from another, whether that order be one that is bound up with physics, or with chemistry, ethics, esthetics, economics, etc. If, however, Professor Sheldon has come to mistake the types of causation identified with physics as exhaustive, this error would be explained in his failure to distinguish at the outset between a causal and a non-causal situation. Suppose we question whether his “two types of causation” are really valid forms of causation. Where would he turn for support in his position if not to the *elements* revealed in a prior distinction between a causal and a non-causal situation? In this way only can we tell whether physics has done full justice to the conception of causation or not. Hence a comparative method involving *all* the sciences is unavoidable to the investigation. And in this aim it is of special importance that

plus a change in them give us the causal situation; whereas two or more terms, not in this relation of change, give us a non-causal situation; and I stand ready to affirm that the causal relation as a "relation" can not otherwise be empirically defined. Not *any* "two terms," but two terms of a "due application" (to revert to Locke's phrase) embodies the differentia of a causation. But I fail to see how Professor Sheldon can define the causal relation by reference to change, unless his phrase,—“two terms plus the relation of combination or sameness unambiguously determine the result”—would read otherwise than it does read when transcribed in terms of *change*; namely, two terms *plus a change* determine a *change*. I would, however, be willing to discount this evident tautology if it were not that Professor Sheldon, according to my understanding of him, explicitly identified the causal situation, not with a cause-effect situation, but with the “cause” as divorced from the “effect” (I shall speak of this later). Hence, the cogency of the conclusion he is seen to draw; namely, two terms plus a relation given, “*the rest of necessity and by a pure deduction follows*.”¹² But how we are to distinguish between a “change-datum” and an “effect,” if “plus the relation” means *change* and the phrase, “the rest of necessity,” etc., means the “effect”; or again, how Professor Sheldon is going to rescue the one or the other or both of these phrases, if this doubling up in *change* is denied, are matters that I find myself unable to grasp. Rather does this complication serve to convince me of my original conclusion, that the phrase “plus the relation” is devoid of any real import. For we do not proceed from a “relation” to “change,” but we proceed from a “change” to the claim that such objects as involve a change indicate a dependence or connection—a relation—which neutral objects, by comparison, are seen to lack. As for the other phrase (“the rest of necessity and by pure deduction follows”) Hume has long since administered the death-blow to its rationalistic implication. For with an emphasis upon change as something real, our “effect” not only becomes an inherent element of the causal situation, but, further, assumes the nature of an independent incommensurable. The principle of sameness to this extent obviously becomes inadequate to the full meaning of a *connection* in cause and effect. On the other hand, to deny a reality to “change” is to convert an apparent causal into a non-causal situation.

I agree with Professor Sheldon that we must assume two or more terms for our cause. But this, as we have seen, is not enough. We must further assume that objects are neutral or effective, partial one should not mistake a particular *theoretical explanation* of causation for a direct investigation of *causation* in general. Professor Sheldon, I feel, did not escape this further error.

¹² *Loc. cit.*, page 375.

or indifferent in respect to each other. When neutral or indifferent objects are brought into conjunction, nothing follows, and our situation is a non-causal one. But where effective or partial objects are brought into conjunction, there a change-datum will appear, and our situation becomes one involving causality. In a word, causation finds its differentia in the fact that disconnections exist among objects as well as connections,—a fact which our inductive methods strikingly exemplify, although philosophy, in dealing with causation, with a possible exception in favor of Locke, has consistently and persistently ignored this distinction. Yet this distinction is so vital and far-reaching that I see in it little less than a revolution for metaphysics. But why certain objects in respect to others are either effective or neutral, that we can not tell. That they are effective or neutral is a matter of every-day and of scientific experience. But when, as Locke wrote, “we penetrate into their causes [as agents] and manner of production, we find our mind discovers nothing but its own short-sightedness.” The assumption of neutral *versus* effective objects (and an object effective in one situation may be neutral in another, and *vice versa*) makes it possible to transcribe the odious, trans-empirical “power” into terms that are strictly empirical, and yet enables us thereby to retain the full scope of the rôle originally assigned to “powers.”

Having once postulated the existence of effective and neutral objects, our next aim should be an investigation into the varied ways a given causal situation is handled by different men or sciences; for one might call that a change (hence a causal situation) which another might deny, as noted above in connection with chemistry. The same holds true in respect to the measure and boundary affixed to our objects. They are variously defined in virtue of varying principles which we either consciously or unconsciously adopt. Yet the specific conception of our objects is so important that, without it, the substantive or adjective status of our change-datum can never be determined. But in a preoccupation with principles so vast and varied, we drag in metaphysics by the wholesale. Mass, motion, space, conservation of energy, sense-perception, in mutual harmony or in opposition, are but a few of the many principles that would determine us in such decisions. Evident constructs, then, are present in any conception of the causal situation. Hence to speak of causation as found apart from “the form imposed on it by mind” seems to me not only a needless, vitiating restriction in our conception of the problem, but one that, in advance, precludes a full and complete analysis and estimate of its various parts.

A comparative method of the order suggested, then, such is my opinion, would aid us in more narrowly defining the elements pe-

culiar to the causal situation. Such a peculiar characteristic of the situation, I think, is to be found in the fact that the "effect" in respect to its "dual cause" embodies an "incommensurable element," even in those specific cases of a cause-effect series designated by chemistry as reversible. Such a reversible series is offered by "water" in respect to its origin from and return to H_2O . Yet water as water is as unique and as distinct a phenomenon as hydrogen or oxygen; *i. e.*, water is not wholly to be explained in terms of hydrogen and oxygen. Here lies the tantalizing enigma. Something inherently new has emerged, yet something can not come out of nothing. Nor can "agents" and "powers," in their odium, offer us any assistance. They help to indicate, however, as a matter of tradition, that the enigma is one that is inherently real. Yet Professor Sheldon seems to glide over it even in his causation of the type called "composition." Two terms with him "combine to produce a third in which they are preserved intact."¹³ (Are hydrogen and oxygen, as hydrogen and oxygen, held intact in water)? "The first [the dual cause] is more fundamental than the second [the effect] *only* in the sense that the second is defined by reference to the first, but not conversely."¹⁴ The reason he offers is that the cause and the effect are fundamentally identical except for their occurrence in a "time" that is "existential" and "irreversible." We therefore require a reference from effect to cause, and not the converse, he thinks, because "the past has a certain existential rank higher than that of the future."¹⁵ Otherwise identical, the effect, it seems, would demand no explanation. It is wrong, then, he thinks, to speak of a cause as if it gives "rise to, or necessitates, or in any way accounts for, the effect."¹⁶ Yet we *do* speak of the cause in the manner Professor Sheldon would here proscribe, and we do so for the reason that a given result in respect to its dual cause is an incommensurable, and because a given result is invariably bound up with one or another (not merely *any*) specific set of conditions. We do this because we think it pertinent to refer to the specific terms with which a given effect is commonly found associated; our sole alternative would be to refer to any term at random. And the need or necessity to refer to some term or other appears to be bound up with the fact that the effect is at once something new and incommensurable. If, accordingly, we did not seek to find its origin and explanation in this special reference, where are we to turn for its origin and explanation? Hume's insistence upon the incommensurable character of the effect is a matter of tradition. His exaggerations, no doubt,

¹³ *Loc. cit.*, page 371.

¹⁴ *Ibid.*

¹⁵ *Loc. cit.*, page 372.

¹⁶ *Loc. cit.*, page 371.

are susceptible to correction; but they are not susceptible to a reduction to a zero, without reducing the reality of causality itself, and every principle it leans upon for support, to a zero. Yet the only incommensurable element that Professor Sheldon appears to retain for an "effect" is an irreversible, existential time, with a "past" that is assumed to be of a higher rank than a "future."

The foundation of a causal *versus* a non-causal situation is one thing; an explanation of our "effect" as an event distinguishable from the dual terms of the "cause," another. The first, I think, is found in the distinction between terms as neutral and as effective; the second is found by a method of comparison involving qualitative and quantitative likenesses and differences. If an "existential time" presents itself as such an element, well and good. That "time," however, constitutes the *sole* difference, or that it constitutes the real distinction between a causal and a non-causal situation, are conclusions that I, for one, at least, could hardly accept. Nor would either chemistry or physics justify us in such a conclusion. In them, time constitutes but one possible element among other elements (as temperature, pressure, etc.) in a multiple cause as necessary to a certain result. But whatever the specific conditions of a given "effect," the effect would never acquire its distinctive character if it did not embody an incommensurable of some independence. Deny its incommensurable character and we may ask, why speak of a causation at all? I fear a too exclusive dependence upon physics in support of his explanation of the causal situation has reaped its penalty; for while the incommensurable element offers nothing that is peculiar or real in the causal situation of a science almost exclusively dependent upon the principle of conservation, this disposition of the incommensurable element, however far it may validly be carried in a certain direction, would still have such difficulties confronting it as sense-perception presents, whether or not such elements, from the standpoint of physics, are labeled as secondary or illusory.

The objections I have raised in connection with Professor Sheldon's postulate of "two terms" are, (1) that he neglects to distinguish and to give a foundation for "two terms" of a causal and "two terms" of a non-causal relation; (2) that his principle of "sameness" with a difference in an "existential time," fails to do justice to the conception of an effect as something independent (incommensurable) and as something dependent (upon a cause); and (3) that he fails to recognize the constructive process which any specific solution of the cause-effect relation necessitates and entails. It is in an estimate of the principles thus laid bare, however, that an exposition and a definition of causation are alone made possible.

I turn to a consideration of Professor Sheldon's next main

result. It relates to the subject of an existent necessity. He writes that "the main results of this [his] investigation are, that there is a necessity in the existent world, and that it is not an absolute *a priori* necessity, but one *derived from* the existence of a dyadic relation."¹⁷ Had Hume, he thinks, "examined specific cases of causation, or had he even told us what necessary connection meant, the present almost universal philosophical skepticism in regard to its history might not have come into being. One great obstacle to his search was that he treated a cause as *one* instead of *two*."¹⁸

Grant that Hume did not "tell us what necessary connection meant." What, then, is it for Professor Sheldon? The answer is, that necessity is a *connection* in cause and effect based upon sameness with a difference. The emphasis is upon sameness. Hume, I take it, reversed the terms thus emphasized and accordingly denied a connection. Professor Sheldon, however, not only affirms the reality of a connection, but affirms it to be one of the existent world. It is a thing, therefore, that is not to be imputed to a thought-process. But such a position is infected with what is overtly contradictory. For if it be true that sameness and difference are vital to the thought-process in general, the conclusion would seem to be that they are principles of thought rather than of things, although things may and do show themselves amenable to them. What I mean is, that a sameness or a difference that is vital from one standpoint in the determination of an object's specific measure and boundary may be negligible from another, and *vice versa*. Thus a Shakespeare and an idiot, a criminal and a saint may be fundamentally the same from one standpoint and fundamentally different from another. Yet Professor Sheldon deals with sameness and difference as if they were existential constants. Without pausing to discuss the issue, therefore, let us assume with Professor Sheldon that sameness and difference are existential constants in the full sense that his position demands. In that event it is necessary to ask, whether the cause-effect *duality* finds its reality in the fact of a difference? If so, what reality can we gather for the duality, if our difference (the incommensurable) is disposed of as approaching zero, except for an existential "time" with a past of a higher rank, as he assumes, than a future? On the other hand, what reality can we gather for *connection*, if based upon *sameness* and a fixed or variable scope is permitted to difference? Unless a scope is given to difference, the cause-effect *duality* vanishes; and if a scope be granted to difference, we to that degree diminish or neutralize our connection. The dilemma is a serious one. Professor Sheldon meets it by his assumption of an existential time.

¹⁷ *Loc. cit.*, page 376.

¹⁸ *Loc. cit.*, page 375.

Cause and effect appear at different intervals in time, and herein, he thinks, lies their sole difference. Thus he speaks of the effect as "another case" of the cause, although "another case" of it with a time difference. Sameness is still made to bear the burden of a causal connection,¹⁹ in contrast with which, difference is made to carry no burden; and "that two terms can be the same while different does not seem contradictory"²⁰—such is his version. But suppose we focus attention upon a causal *situation* and not upon a causal *connection*. In that event, would difference still be released of its share of burden? And if not (as I must affirm), how avoid neutralizing the *connection* that an affirmed *duality* in the cause-effect relation naturally entails? If, however, it be maintained that no difference between cause and effect exists except the one difference in "time," suppose we ask whether our "effect" also consists of *two* terms as Professor Sheldon claims for a "cause"? For if our cause is *two* and our effect *one*, how can the effect be "another case" of this cause, unless this particular "difference" (together with all other differences in our effect except that of time only) be one that is negligible? But if a duality of terms is a negligible difference in the effect, it must also be held to as a negligible difference in the cause. But it is not a negligible difference in the cause, as Professor Sheldon's indictment of Hume in the above extract emphatically proclaims. Then how can it be a negligible difference in an "effect" that is at bottom but "another case" of the "cause"? One can not thus blow hot and cold with the same "difference," especially when one is committed to the task of dealing with difference and sameness as if they were existential constants. Deny that they are existential constants, and our argument at once shifts to principles even more damaging to his position. For once admit that a sameness or a difference in objects is a variable, then a causation that is based upon a "sameness with a difference," where *sameness* bears the burden of *connection*, converts its supposed connection into a disconnection and its necessity into a sheer contingency, or the reverse.

Notwithstanding these difficulties and consequences as incident to his position within the range of his own argument, suppose we allow that sameness in cause and effect guarantees the connection between them and that a difference in time is all that Professor Sheldon says of it and that it is adequate to the full meaning of an "effect." In that case it still remains to ask whether or not I have an instance of causation when I clearly have recourse to "sameness" and "time" in considering objects of a purely static relation, as in the case of two successive, unconnected rain-drops falling from a roof or between two

¹⁹ *Loc. cit.*, page 372.

²⁰ *Loc. cit.*, page 374.

unconnected rain-drops in juxtaposition on some leaf? If the crux of a causal situation for him is an existential time, why does not the time-interval of the falling drops suffice to convert them into a causal relation? Or if "two terms with a relation of sameness" yields a type of causation, why do we fail to have a causal situation with our *identical*, unconnected rain-drops? And this facility of "sameness" and "time" to convert a causal into a non-causal relation, or the reverse, holds true apart from the flexibility the principle of "a sameness with a difference" acquires, as noted above, if denied the status of an existential constant.

I conclude that a connection in causation primarily based upon sameness or a disconnection in causation primarily based upon difference (Hume), fails to make good. It fails to make good for the reason that *the existence of a connection can be proved only by reference to its affirmed opposite—disconnection*, or the reverse. Without *change*, such a distinction fails to appear. Admit change to be *real*, and the difference between connection and disconnection is real. Deny change to be real, and the difference between connection and disconnection ceases to be real. Without the reality of a disconnection, however, the reality of connection has no import. For like "sameness" and "difference," connection and disconnection constitute terms that are correlative, and hence they either rise together or they fall together.

But what a "connection" has to do with a "necessity" (the next step in his argument), is not evident, unless such connection reflects itself as a principle of control in thinking or in the behavior of objects. Hence to prove an "existent necessity," demands that we show a fixed or regular behavior among objects uninfluenced by a thought-process. Now sameness in objects may embody a principle of such control in thinking, but in what its necessity may consist in the behavior (active relation) of objects, remains unilluminated darkness for me in the exposition of causation under discussion.

"That there is a necessity in the existent world," however, I have come to take for granted; and in conclusion offer my reasons in support of the contention. In this I purpose a further independent contribution to the subject. (a) Mutually effective terms exist in contrast to terms that are mutually neutral. In the former case, *a* change appears, although *what* change remains *a priori* unknown. But the change, if the terms are mutually effective, *will* appear. The necessity works both ways. The change *will not* appear if our terms are mutually neutral. This is the first moment of a causal necessity as I have come to conceive it. (b) The second moment of a causal necessity presents itself in the fact that a given set of conditions *produces* but one given result; hence *any* terms taken at random

can not produce this specific result. (c) And the third moment of necessity is found in the fact that the *same* set of conditions will always have the *same* result. Hence we may conclude that *effective terms are bound up in a way of dependence and connection that neutral terms lack*. But what specific terms are bound up with what specific terms in this effective and in this neutral way, is, as I understand it, the aim of all science to discover.

Such "necessity," I hold, is of the "existent world"; but this existent necessity is not, of need, the only "necessity" present in an analysis of the causal situation. Other principles, abstract or what-not, as indicated above, enter and determine it as well. But with such corrections and suggestions as have been offered, I feel my reply to Professor Sheldon may be brought to a close.

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REVIEWS AND ABSTRACTS OF LITERATURE

- Bergson and Romantic Evolutionism*. Two Lectures Delivered before the Philosophical Union of the University of California. A. O. LOVEJOY. Berkeley: University of California Press. 1914. Pp. 61.
- Studies in Bergson's Philosophy*. ARTHUR MITCHELL. Bulletin of the University of Kansas. January 1, 1914. Pp. 115.

Both Professor Lovejoy and Professor Mitchell are manifestly and confessedly very much influenced by Bergson, but neither is willing to be regarded as a follower of that philosopher. Professor Mitchell undertakes a summary and a criticism of the principal aspects of Bergson's philosophy, and his studies are largely concerned in pointing out contradictions, although he concludes with a high expression of appreciation. Professor Lovejoy, on the other hand, while admitting many logical flaws in Bergson's notions of time, matter, and the like, is minded to dwell not on these, but rather on that which to him constitutes the French philosopher's chief significance,—to wit, "that he has revived this hypothesis of Romantic, activist, or radical evolutionism."

This hypothesis Professor Lovejoy welcomes as taking the place of the mechanistic philosophy of nature which has been in alliance with thinking on evolution, and through it he hopes to see the intolerable "spectacle of a 'block-world'" exorcised. "Bergson," he continues "has presented to us the future of a world which is at bottom alive, in which in truth there is at every moment 'something doing' and something to do; in which there is a striving in progress which all *our* strivings help or hinder; in which, finally, the future contains the possibility of unimaginable fresh creations, of a real and cumulative enrichment of the sum of being." This concept of an evolution which is a real becoming Professor Lovejoy finds will lead on to a new philosophy of religion, inasmuch as it will give